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Proposal of an Application for the Identification of Hospitals and Clinics for Pediatric Emergency Care

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Abstract **- The present research work focuses on a proposal for an application for the identification of hospitals and clinics for pediatric emergency care. That is why a RUP methodology has been used, since it is considered that in their respective phases the problem and the solution would be adequately described in order to identify hospitals and clinics. Likewise, a survey was conducted with 5 parents to know if they agreed to use a mobile application to be able to know which hospital or clinic are closest to their location. It was concluded that the creation of a mobile application to help identify hospitals and clinics would be of great help to different users.**

Index Terms **- Mobile application, RUP methodology, hospitals, survey.**

INTRODUCTION

Pediatric emergencies are urgent medical situations that affect children and adolescents, from newborns to approximately 18 years of age. These emergencies can involve serious and life-threatening medical problems that require immediate attention to avoid major complications [1].

Therefore, a pediatric emergency can quickly worsen if an immediate health center is not found due to several factors, by not receiving timely medical attention, the underlying condition can worsen, which can lead to more serious complications or even endanger the life of the child.

In emergency situations, every minute counts, the delay in receiving treatment can result in faster progression of the disease or injury and make effective management difficult. In many cases, pediatric emergencies can be rapidly changing. Without immediate access to medical care, the patient's condition can deteriorate rapidly, making management even more difficult and increasing the risk of complications [2].

In some cases, treatment can prevent or minimize the risk of long-term sequelae. If not treated properly and quickly, the child may face long-term health problems.

Also, in certain emergency situations, specialized medical interventions or advanced medical equipment are required that are only available in specialized hospitals or health centers [3].

Technology can play a critical role in improving pediatric emergency care and management. Telemedicine allows real-time communication with health professionals, which can be especially useful in remote areas or with limited access to medical services. Doctors can perform initial evaluations, give instructions and guidance on how to handle the emergency until a health center can be accessed. There are apps and platforms designed to provide information and education about first aid and how to handle pediatric emergencies. These apps can provide step-by-step instructions on what to do in different emergency situations [4].

Communication technology in hospitals and healthcare facilities can enable faster and more effective collaboration between different members of the medical team caring for a pediatric patient in an emergency. On the other hand, the technology can be used to implement alert and notification systems that alert medical teams about pediatric emergency situations in real time [5].

The main objective of the research is to design a mobile application that allows users to identify hospitals and clinics for pediatric emergencies so that the care of the child is faster and more feasible.

The present research work is divided into II literature review, III methodology, IV discussion and V conclusion.

LITERATURE REVIEW

The author [6] focuses on the development of a computer tool to improve out-of-hospital pediatric emergency care has been motivated by the lack of experience of some professionals in this field and the possibility of making errors in the calculation of patient weight and medication management. The GIDEP and WEST working groups have developed the "GIDEP-WEST Paediatric Emergencies" App, which uses a proprietary formula-based algorithm to calculate patient weight and provide precise doses of medications. In addition, the App contains care protocols constantly reviewed and updated. This free App is available for Android and IOS devices and can be used by health professionals in out-of-hospital emergency care.

In conclusion, the use of the App "GIDEP-WEST Pediatric Emergencies" has shown good results in improving patient care and safety in out-of-hospital pediatric emergencies, thanks to the accurate calculation of weight and the handling of medications with minimal errors.

Likewise, the author [7] focuses on creating and testing an accurate tool to estimate weight in pediatric emergencies. To do this, data from pediatric patients seen in primary care in Bilbao, Spain, were used and mathematical models were developed to calculate weight based on height. These models were then applied to a sample of pediatric patients treated at two major hospitals. The results revealed that the "Bilbao formulas" provided highly accurate weight estimates, as they showed a significant correlation with actual weight and a small average difference. In addition, the vast majority of weight estimates were within a margin of error of 10% and 20% compared to actual weight, outperforming other traditional formulas.

On the other hand, the author [8], tells us that it is essential that health personnel provide rapid and high-quality care in pediatric emergency situations, avoiding additional injuries or damage. To address this problem, a study has been developed that seeks to improve the quality of care and satisfaction of the pediatric user through several actions, such as training workshops for health personnel, internships, the creation of an organization and functions manual, and an awareness plan that includes the implementation of a mobile booth to improve communication and information to users. The ultimate goal is to achieve an optimal recovery without sequelae for pediatric patients.

METHODOLOGY

For the realization of this research work, a RUP methodology was used, which will be detailed as follows.

Fig. 1 shows the phases used in this research, starting with empathy, definition, design, prototyping and, finally, testing, all of these phases will complement each other in order to obtain favorable results such as the creation of the child care and assistance application.

a) Beginning

The main objective of the research is to design a mobile application that allows the user to identify hospitals and clinics for pediatric emergency care. That is why, it has to be detailed.

- *Functionalities of the application:* The design of the application must have a login that will allow the user to store their searches. Likewise, the user must allow access to their location so that the nearest hospitals and clinics are known.
- *Geolocation and maps:* For this the option to allow location must be activated.

b) Elaboration

Figure 1 shows the architecture of the system and who is involved in the proposal of the mobile application. Users will have to access the application that will work with the internet, where they will have to allow their location to be used so that the application shows a list of hospitals and clinics with pediatric emergencies closer, the application will allow to save the data sought.

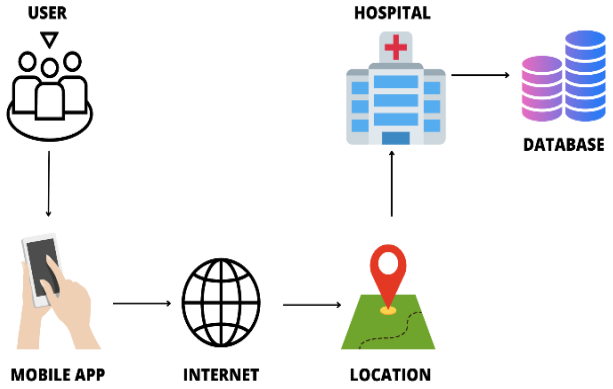

Fig. 1 System architecture

c) Construction

The proposal of a mobile application for the identification of hospitals and pediatric emergency clinic was designed. That is why, in Figure 2, it is shown what would be the home screen of the application.

Fig. 2 Home Screen

Figure 3 shows what the user will need to do. For that, the user is asked to select their location. Once your location is selected, you will be presented with a list of the nearest pediatric hospitals and emergency clinics as shown in Figure 4.

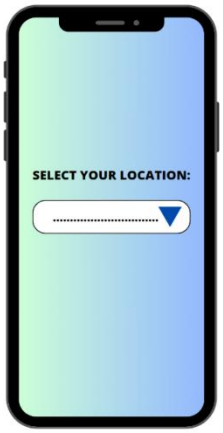

Fig. 3 Select location

Fig. 4 List of nearby hospitals/clinics

Also, Figure 5 shows the screen when selecting a hospital or clinic showing its address and hours of operation, so that the user knows the exact address of where the hospital / clinic I select is.

Fig. 5 List of nearby hospitals/clinics

d) TRANSITION

For this phase, a small survey was carried out to 5 parents to know what they think of the proposal of the design of the mobile application.

1) Do you think that a mobile application could help identify hospitals and pediatric emergency clinics? By asking this question it is expected to know that the use of applications to improve and identify hospitals will be of great help. 100% agreed. Figure 6 shows the result.

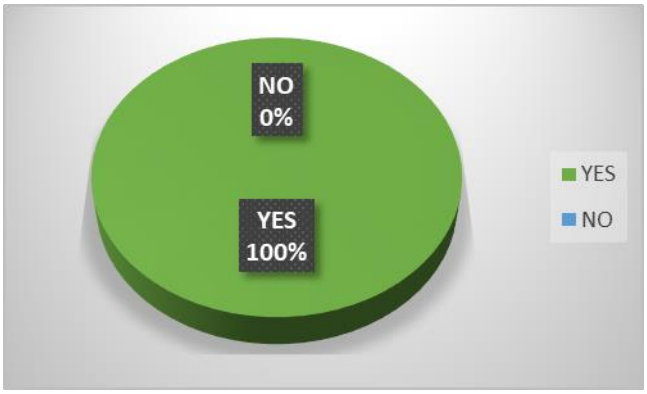

Fig. 6 Mobile application

2) Would you use an application to know which hospitals and clinics are close to your location? Figure 7 shows the results of the question where it is observed that everyone is in favor of using an application to know the hospitals and clinics closest to their location.

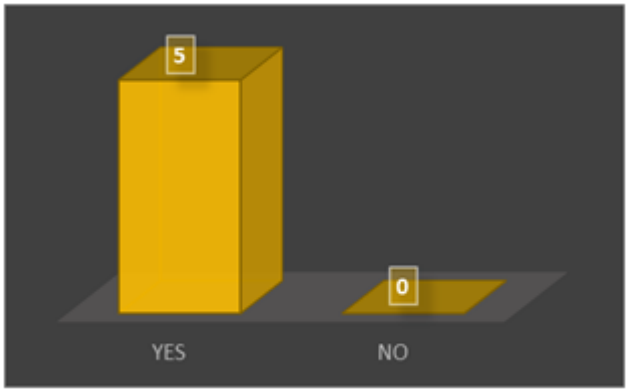

Fig. 7 Use of the mobile application

DISCUSSION

The development of a mobile application such as "GIDEP-WEST Pediatric Emergencies" [6], to improve out-of-hospital pediatric emergency care is undoubtedly a significant advance in the field of medicine and technology. This informatics tool has the potential to provide more efficient and accurate care to pediatric patients in critical situations, which can make the difference between life and death in certain cases.

One of the highlights of this application is its focus on solving the lack of experience of some professionals in pediatric emergencies and the possibility of making errors in the calculation of patient weight and medication administration. The proprietary formula-based algorithm that calculates patient weight and provides accurate drug dosages is a major step forward in ensuring proper and safe care. This is especially relevant in the context of emergencies, where every minute counts and accurate and fast decision-making is crucial.

In addition, the inclusion of constantly reviewed and updated care protocols in the application is a valuable measure to ensure that health professionals have access to the most up-to-date information and best practices in pediatric emergency care.

However, it is important to note that although this app can significantly improve patient care and safety, it does not replace the experience and clinical judgment of healthcare professionals. Technology is a powerful tool, but it should not be considered as a substitute for medical knowledge and practical experience.

In addition, it is critical to ensure that the app is widely accessible to all healthcare professionals working in pediatric emergencies. Not all hospitals or clinics may have access to mobile devices or the technology needed to use the app, which could limit its reach and potential benefits.

Another aspect to consider is the need for a Adequate infrastructure to support the use of the application. This includes ensuring a stable internet connection and robust security systems to protect the privacy and confidentiality of patient data.

The development of a mobile application [7], to identify pediatric hospitals and emergency clinics is a valuable initiative that could have a significant impact on the healthcare of younger patients. However, it is important to note that although the app may be useful for locating care facilities in emergency situations, it should not be considered as a complete solution or substitute for professional medical care.

The application based on the "Bilbao formulas" to estimate weight in pediatric emergencies is undoubtedly an interesting innovation that can help health professionals make more informed and accurate decisions during the treatment of pediatric patients in critical situations. The use of data from pediatric patients seen in primary care in Bilbao, Spain, and the application of mathematical models to calculate weight based on height demonstrates a scientific and evidence-based approach.

However, it is crucial to consider the limitations and possible biases in the sample of patients used in the study. The sample may not be fully representative of the diversity of the paediatric population and there may be differences in outcomes based on factors such as age, gender, previous health status and other aspects. Therefore, additional research and testing in wider and more diverse populations should be conducted to fully validate the accuracy and applicability of the "Bilbao formulas".

In addition [9], it is essential to maintain a critical view on the results and recognize that, although the weight estimates provided by the application are highly accurate in most cases, there may always be exceptions and particular situations that require a more detailed and personalized evaluation by medical professionals.

Another important aspect to consider is the accessibility and availability of the application. While mobile technology has advanced significantly and many people have access to mobile devices, there may still be segments of the population with limited access or familiarity with the technology, which could affect the effectiveness of the app in certain contexts.

DISCUSSION

The creation of a prototype mobile application to identify pediatric hospitals and emergency clinics is a promising and important initiative in the field of health care. This tool can play a crucial role in pediatric emergency situations by providing fast and accurate information on the location and availability of specialty care facilities.

The use of mathematical models, such as the "Bilbao formulas", to estimate the weight of pediatric patients and improve the accuracy in drug administration represents a significant advance in the field of medicine and can have a positive impact on the safety and efficacy of treatment.

However, it is important to emphasize that this application should be considered as a complementary tool to professional medical care and not as a replacement for the experience and clinical judgment of health professionals.

Mobile technology can facilitate location and access to emergency services, but it should always be used responsibly and in conjunction with specialized medical care.

In addition, special attention should be paid to the validation and continuous improvement of the application to ensure its accuracy and efficacy in different scenarios and pediatric populations. The inclusion of a diverse and representative sample in the development and testing of the prototype is critical to ensure its applicability and usefulness in a wide range of situations. It is also necessary to address challenges related to the accessibility and availability of the application to ensure that it can be used by as many people as possible, regardless of their level of familiarity with the technology.

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